

Claims

- [c1] 1. A cleaning method used in an interconnect process, comprising the steps of:
providing a substrate having a conductive layer and a dielectric layer formed thereon, wherein the conductive layer is formed over the substrate and the dielectric layer is formed over the conductive layer;
forming an opening in the dielectric layer to expose a portion of the conductive layer; and
cleaning the opening using a mixture containing sulfuric acid and hydrogen peroxide in water.
- [c2] 2. The cleaning method of claim 1, wherein the concentration of the sulfuric acid in the mixture is between 0.1M to 0.2M.
- [c3] 3. The cleaning method of claim 1, wherein the concentration of the hydrogen peroxide in the mixture is between 1.1M to 2.0M.
- [c4] 4. The cleaning method of claim 1, wherein the opening is cleaned using the mixture containing sulfuric acid and hydrogen peroxide heated to a temperature between 30°C to 40°C.

- [c5] 5. The cleaning method of claim 1, wherein the opening is cleaned using the mixture containing sulfuric acid and hydrogen peroxide for a duration of about 30 to 90 seconds.
- [c6] 6. The cleaning method of claim 1, wherein the opening is a contact opening or a dual damascene opening.
- [c7] 7. The cleaning method of claim 1, wherein the conductive layer is a composite layer comprising a titanium/titanium nitride layer, an aluminum/copper alloy layer and another titanium/titanium nitride layer.
- [c8] 8. A cleaning method used in forming metallic interconnects, comprising the steps of:
providing a substrate having a dielectric layer formed thereon;
forming an opening in the dielectric layer;
cleaning the opening using a mixture containing sulfuric acid and hydrogen peroxide in water; and
depositing conductive material into the opening.
- [c9] 9. The method of claim 8, wherein a concentration of the sulfuric acid is between 0.1M to 0.2M.
- [c10] 10. The method of claim 8, wherein a concentration of the hydrogen peroxide is between 1.1M to 2.0M.

- [c11] 11. The method of claim 8, wherein the opening is cleaned using the mixture containing sulfuric acid and hydrogen peroxide heated to a temperature between 30°C to 40°C.
- [c12] 12. The method of claim 8, wherein the opening is cleaned using the mixture containing sulfuric acid and hydrogen peroxide for a duration of about 30 to 90 seconds.
- [c13] 13. The method of claim 8, wherein the step of forming an opening in the dielectric layer comprises performing a photolithographic process and an etching process in sequence.
- [c14] 14. The method of claim 8, wherein the opening is a contact opening, a dual damascene opening or a trench.
- [c15] 15. A cleaning solution used in an interconnect process, comprising:
sulfuric acid, at a concentration between 0.1M to 0.2M;
hydrogen peroxide, at a concentration between 1.1M to 2.0M; and
purified water.